

Abstract of the Disclosure

A Synthetic Aperture Radar (SAR) avoids the need for an INS/GPS by focusing a SAR image having discernible features and a center. The image is formed from digitized returns, each of the digitized returns having a phase and an amplitude. The focusing steps of an algorithm processing the digitized returns include: computing a coarse range and coarse range rate of the center of the image, motion compensating the digitized returns, converting the digitized returns in polar format into an orthogonal Cartesian coordinate system, autofocusing the image data to obtain a focused image, performing a Fourier transform to obtain a focused image described by the returns, computing an estimated fine range and fine range rate from features contained within the focused image, and converging the fine range and fine range rate within the orthogonal Cartesian coordinate system for use within the azimuth and range coordinate system and motion compensating the digitized returns.